ABSTRACT OF THE DISCLOSURE

For designing communication paths of tree in a network, an objective function is defined for minimizing a number of candidate tree graphs for accommodating said communication paths and a first constraint equation is defined for causing all of the candidate tree graphs to form a tree. A second constraint equation is defined for accommodating the communication paths in one of the candidate tree graphs. A third constraint equation is defined for determining whether each of the candidate tree graphs is used to accommodate the communication paths. A mathematical programming problem formed by the objective function, and the first, second and third constrain equations is solved to obtain a plurality of trees in which the communication paths can be accommodated.